

February 10, 1989

CD-89-01 (LD)

Dear Manufacturer:

Subject: Update on Side Fan Cooling

This letter updates the policy contained in my two previous letters dated May 20, 1988 (CD-88-07 (LD)) and September 2, 1988 (CD-88-14 (LD)) concerning the use of side fan additional cooling. This letter changes the implementation date of our decision to require justification to use side fan cooling on FTP testing of certification vehicles (1991 model year vehicles tested after September 1, 1989), it changes the recommended temperature for on-road testing (from a "minimum" of 95 F ambient to "approximately" 84 F fuel tank temperature), and it no longer requires emissions data to justify the standard side fan cooling configuration when fuel tank temperatures are measured. A sample data collection procedure and method to analyze the data is also included as an enclosure.

For the reasons discussed in the previous letters, effective for 1991 model year vehicles tested after September 1, 1989, side fan cooling will not be allowed for FTP testing unless the manufacturer makes the necessary showings required in the regulations. EPA will continue to allow the standard side fan cooling configuration on highway tests without any demonstration of need. Additional side fan cooling (and other types of additional cooling as well) are allowed under 40 CFR 86.135(b) if "the manufacturer can show that during field operation the vehicle receives additional cooling and that such cooling is needed to provide a representative test...."

In evaluating a request for side fan cooling, EPA will consider any information submitted by the manufacturer demonstrating that vehicles receive additional cooling in use and such additional cooling is needed for a representative test. Requests should include information showing that the normal cooling configuration insufficiently cools the fuel tank in normally encountered urban driving temperature conditions. Data on fuel tank cooling under reasonably encountered high ambient temperature conditions is most appropriate. We believe such testing should be performed at (or simulate performance at) approximately 84 F (which is the ending temperature in the heat build portion of the FTP, and is approximately the starting temperature of the

driving portion of the FTP).

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Listed below are examples of the type of information EPA would examine when considering a request for side fan cooling based on fuel tank temperature data:

1. Description of test conditions, including:
 - Ambient temperature (for best comparison of road and FTP test data, the road data should be gathered on vehicles where the fuel tank temperature has reached approximately 84 F during an outdoor soak and the ambient temperature is approximately stable or is still rising)
 - Cloud conditions (e.g., partly sunny or sunny)
 - Engine/evaporative family
 - Vehicle body configuration
2. Description of the parameters measured (e.g., fuel tank temperature)
3. Description of how additional cooling was achieved (e.g., standard side fan cooling configuration)
4. Results of parameter measurements
 - During field operations
 - On dynamometer with side fan cooling
 - On dynamometer without side fan cooling
5. Explanation of how the measured differences affect emissions. (We have already determined that differences in fuel tank temperatures can lead to differences in emissions, consequently this information is not needed when fuel tank temperature is the measured parameter. If differences in other parameters are being used to justify additional side fan cooling, then data showing the emissions relevance of the measured parameter will be helpful in evaluating the request.)

EPA has run a limited test program to evaluate one possible data collection and analysis procedure for determining the appropriateness of use of the side fan to achieve a representative test. This procedure is outlined in the enclosure and is provided as an example of at least one general approach we believe is workable and appropriate. EPA will consider other approaches.

This procedure simply compares the average fuel tank temperature rise observed using each standard fan configuration with the average temperature rise observed on the road to determine which configuration results in the more representative test. This is consistent with EPA's longstanding desire to standardize dynamometer cooling configurations as much as possible. (Highly specialized cooling setups will not likely be acceptable for use at MVEL for certification testing.)

Only sufficient cooling to achieve a representative emissions test will be considered for approval. If there is a safety concern that requires additional cooling to some component (e.g., brakes), EPA will not approve a cooling configuration that unrepresentatively overcools the fuel tank. (This would defeat EPA's intention to provide a representative test for evaporative and exhaust emissions.) If a side fan is requested to address a safety concern, information regarding the occurrence and methods of preventing any unrepresentative impacts of this cooling would be helpful in evaluating such a request.

We have not developed specific grouping criteria for determining which vehicles may be represented by a given vehicle test program. Manufacturers will need to consider factors such as car line, fuel tank configuration, proximity of the fuel tank to the exhaust pipe and catalyst, and other parameters specific to each manufacturer's product line which would be expected to have a bearing on the cooling and heat rise characteristics of vehicle fuel tanks. Manufacturers will need to propose appropriate groups to EPA for approval.

Manufacturers should allow EPA sufficient leadtime to evaluate side fan cooling requests. Manufacturers should not use additional cooling of any type which has not been approved by EPA for official testing at their facility.

In their letter to me dated November 11, 1988, the Motor Vehicle Manufacturer's Association (MVMA) suggested that we schedule a workshop to discuss extra cooling matters. We have met with MVMA, and believe we have responded to their specific concerns. We do not believe that a full workshop is needed. However, we are willing to provide a forum for questions and answers which may be needed to clarify this letter. We propose to do that in conjunction with the next EPA/Industry Bi-monthly Meeting scheduled for March 22, 1989. Please submit any questions you may have regarding this letter along with your normal submission for the bi-monthly meeting. If there are only a few questions,

we will incorporate them into the regular meeting agenda. If there are a substantial number of questions, we will schedule a separate session in the afternoon following the bi-monthly meeting for those individuals interested in this issue.

Sincerely,

Robert E. Maxwell, Director
Certification Division
Office of Mobile Sources

Enclosure

ENCLOSURE

Side Fan Testing Example

Example data collection procedure and method to analyze data supporting requests for the standard side fan cooling configuration:

Data submitted on fuel temperature increases during:

1. FTP testing without side fan cooling;
2. FTP testing with side fan cooling
3. Road testing driving a road route which simulates the FTP cycle (run on partly sunny to sunny day where the vehicle has soaked outdoors until the fuel tank temperature is approximately 84 F and the ambient temperature is approximately the same and stable or is still rising).

A minimum of two tests run in each condition.

Data is analyzed by comparing the average on road fuel temperature rise to the two FTP tests averages (side fan and no side fan).

The cooling configuration on the dynamometer that most closely duplicates the road condition would normally be selected as the "representative" configuration. (If the data made the selection a close call, further analysis that

considers cell differences between EPA and manufacturer
labs and data variability would be considered)